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CC: Dr. G. H. Gehring, Federal Division

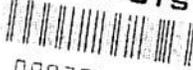
Report 26-47

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EPA-OTS



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April 22, 1947

HEXAMETHYLENE DIAMINE AND
HEXAMETHYLENE DI-ISOCYANATE

As per our phone conversation of April 21, hexamethylene diamine is a skin irritant and will also irritate the eyes and mucous membrane of the nose and throat. Our experimental work has been on rats only, but concentrations as low as 1% (in vaseline) produced contact irritation of the skin.

We have carried out acute toxicity tests on rats with hexamethylene di-isocyanate and find the oral M.L.D. to be 0.94 grams per kilo body weight. Rats that died showed gastric irritation with edema and cyanosis of the mucosa and some necrosis of the superficial cells of the mucosa. Reports from I.C.I. indicate that hexamethylene di-isocyanate is highly irritant to the skin and eyes. In addition, it is absorbed readily through the skin so that care must be taken to avoid skin contact when the compound is being handled.

HASKELL LABORATORY OF
INDUSTRIAL TOXICOLOGY

John H. Foulger, M.D.
Director

BY: Allan J. Fleming, M.D.
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SANITIZED VERSION - 11/27/18

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Copies to: J. B. Armitage (6)

E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial Medicine

HASKELL LABORATORY REPORT NO. 78-67 MR. NO. 946-1

Materials Tested: Polymer G - Ethylene methacrylamide propyltriethoxysilane Haskell Nos.:
copolymer, as: 1) 4958

2) Polymer G, ca. 1% in dimethyl phthalate* 2) 4982

Materials Submitted by: J. B. Armitage, Plastics Department Other Codes: 1) 10104-23A
Polylefine Division 2) --

SKIN TEST FOR CERVICATIVE LOCAL EFFECT

Procedure: Twenty male albino guinea pigs were epilated with zip® on the left back prior to the start of the test. Six guinea pigs received 0.1 ml of 1% Polymer G in dimethyl phthalate (), five times a week on the same site, and six other guinea pigs were similarly dosed with 1% Polymer G in Percelene® (). The other eight animals served as untreated controls. Observations on all treated animals were made daily prior to each successive treatment, i.e., one day after the first four treatments during the week and three days after the Friday treatments. Serial sacrifice was done four hours after the 10th, 15th, or 20th treatment (Tr. #10, #15, or #20) on the test animals. Serial sacrifice was done four hours at the end of the second week, and also the third week, and all remaining animals were sacrificed at the end of the fourth week. During the fourth week of test, because of dense hair regrowth, the two guinea pigs being treated with the dimethyl phthalate solution () and a pair of control animals were clipped and shaved each morning prior to treatment; the two guinea pigs being treated with Percelene® solution () showed such strong irritation that clipping was inadvisable, and the remaining two control animals also were not clipped.

* Yellow liquid, "1-3 & Polymer G in dimethylphthalate (600 c.c.)", according to evaluation sheet (J. D. Brooks, 1-10-67); brown particles increasingly present at top of liquid during test.

** Pale yellow liquid, quantities untested; few brown particles noted at top of liquid during test.



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Results:

Material and Dosage	Local Clinical Effects	Histologic Changes in Guinea Pig Skin
1% Polymer G in dimethyl phthalate (H-4938) applied: 0.1 ml 100% x 10 - 2 animals. 0.1 ml 100% x 15 - 2 animals. 0.1 ml 100% x 20 - 2 animals.	None clearly attributable to treatment; very minor desquamation noted during 1st-2nd weeks but this condition present to slight extent entire epilated area.	No abnormality observed.
1% Polymer G in Perclene® (H-4982), applied: 0.1 ml 100% x 10 - 2 animals. 0.1 ml 100% x 15 - 2 animals. 0.1 ml 100% x 20 - 2 animals.	Progressive irritation*: mild to strong erythema 6/6 after Tr. #1; edema increasingly present after Tr. #2 - #4; improvement over weekend; focal necrosis 1/6 after Tr. #6, desquamation with stiff skin (dark or cracking) 3/6 after Tr. #9; deepening necrosis, some scabs, during 3rd week; bare spots and scabs during 4th week.	Chronic inflammation: infiltration of epidermis and dermis with polymorphonuclear leukocytes and lymphocytes, edema, necrosis of epidermis; thickening of skin, hypertrophy and hyperplasia of epidermal cells. Changes: mild 1/2, moderate 1/2 after 10 Tr.; moderate 2/2 after 15 Tr.; marked 2/2 after 20 Tr.
None. Eight animals comparably epilated. During 4th week, 2 animals clipped and shaved (control for /) and 2 animals not clipped or shaved (control for /).	Very minor desquamation noted during 2nd week.	No abnormality observed.

Summary: Polymer G as a 1% solution in dimethyl phthalate produced no significant clinical or histologic skin changes in Guinea pigs receiving 10-20 successive applications. The Perclene® solution containing 1% Polymer G was a strong irritant and eventually corrosive when similarly tested.

No intrinsic hazard from Polymer G has been demonstrated in this test with dilute solutions. Perclene® preparations containing Polymer G should be handled similarly to Perclene®, and prolonged or repeated skin contact should be avoided.

* Exacerbation from scratching and initial restlessness a factor.

RER:dbg

Date: June 1, 1967

Report by: Ruth E. Reinke
Ruth E. Reinke

Approved by: John A. Zapp
John A. Zapp

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